In re the application of
McIntosh, et al.
Application No.: 09/854,865
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Group Art Unit: 2112
Examiner: Clifford Knoll
From: Tucson, AZ 85744

Amendments to the Claims

Listing of Claims

This listing of the claims will replace all prior versions, and listings, of claims in the application.

CLAIMS

1 1 (Previously amended) A multi-frame tape library system, comprising:

2 a plurality of individual library frames connected in series, each said frame comprising a
3 pulse signal generator, a plurality of tapes, a plurality of tape drive mechanisms for
4 reading and writing data to said tapes, one or more controllable robot members to
5 move said tapes to and from said tape drive mechanisms and a delay signal generator,
6 at least one said frame also comprising a total count counter;

7 a multi-channel bus coupled to each said frame and comprising a frame bus for carrying
8 information indicative of the presence of each said frame, and a power bus return bus
9 carrying information indicative of the last frame in said series;

10 wherein one of said frames being defined as a first frame and adapted to receive a signal
11 indicative of power being supplied to any one of said frames and generate a delayed
12 signal, each subsequent frame receiving said delayed signal and generating a further

delayed signal and each frame generating a pulse on said frame bus; wherein one of said frames being defined as said last frame and receiving said delayed signal and generating a signal to activate said power return bus; and wherein said total count counter being incremented by each said pulse on said frame bus until said power return bus is activated.

2 (Original) A multi-frame tape library system as claimed in claim 1, wherein the count in said total count counter represents the total number of said frames connected together.

3 (Previously amended) A multi-frame tape library system as claimed in claim 1, wherein at least one said frame generates a frame pulse when said delay signal is generated for that frame.

4 (Original) A multi-frame tape library system as claimed in claim 3, wherein at least one said frame further comprising an individual ID counter being incremented by each said pulse on said frame bus until said frame pulse is generated.

5 (Original) A multi-frame tape library system as claimed in claim 4, wherein the count in said individual ID counter represents the individual ID of the frame with respect to the total number of said frames connected together.

6 (Original) A multi-frame tape library system as claimed in claim 1, wherein said delayed signal generated by each said frame having a predetermined delay value that is approximately constant.

7 (Original) A multi-frame tape library system as claimed in claim 1, wherein said delayed signal generated by each said frame having a delay value that is variable.

8 (Cancelled)

9 (Cancelled)

10 (Cancelled)

11 (Cancelled)

12 (Cancelled)

13 (Previously amended) A method to automatically detect the total count of frames within a modular multi-frame tape library system, said method comprising the steps of:

coupling a plurality of frames to a multi-channel data bus comprising a frame bus and a power bus return bus, each of said plurality of frames comprising a plurality of tapes, a plurality of tape drive mechanisms for reading and writing data to said tapes and one or more controllable robot members to move said tapes to and from said tape drive mechanisms;

designating one of said frames as a first frame;

designating one of said frames as a last frame;

said first frame receiving a signal indicative of power being supplied to any one of said frames and generating a first delayed signal and a pulse indicative of the presence of said first frame;

supplying said pulse to said frame bus;

supplying said delayed signal to a subsequent frame, each said subsequent frame generating a delayed signal and a pulse indicative of the presence of each frame and supplying the pulses to said frame bus;

generating a signal to activate said power return bus when said delayed signal reaches said last frame; and

incrementing a register by each pulse until said power bus is activated.

14 (Original) A method as claimed in claim 13, further comprising the steps of:

generating a frame pulse when said delay signal is generated for that frame;

incrementing a register by each said pulse on said frame bus until said frame pulse is generated.

15 (Original) A method as claimed in claim 14, wherein the count in said counter represents the individual ID of the frame with respect to the total number of said frames connected together.

16 (Original) A method as claimed in claim 13, wherein the count in said register represents the total number of said frames connected together.

17 (Previously amended) A multi-frame tape library system, comprising:

a plurality of individual library frames connected in series, each said frame comprising a pulse signal generator, a delay signal generator, a plurality of tapes, a plurality of tape drive mechanisms for reading and writing data to said tapes, one or more controllable robot members to move said tapes to and from said tape drive mechanisms and at least one said frame also comprising an individual ID counter;

a multi-channel bus coupled to each said frame and comprising a frame bus for carrying information indicative of the presence of each said frame;

wherein one of said frames being defined as a first frame and adapted to receive a signal indicative of power being supplied to any one of said frames and generate a delayed signal, each subsequent frame receiving said delayed signal and generating a further delayed signal and each frame generating a pulse on said frame bus; wherein at least one of said frames generating a frame pulse upon generation of that frame's delayed signal, and wherein said individual ID counter being incremented by each said pulse on said frame bus until said frame pulse is detected.

18 (Original) A multi-frame tape library system as claimed in claim 17, wherein the count in said individual ID counter represents the individual ID of the frame with respect to the total number of said frames connected together.

19 (Original) A multi-frame tape library system as claimed in claim 17, wherein said multi-channel bus further comprising a power bus return bus carrying information indicative of the last frame in said series; and wherein one of said frames being defined as said last frame and receiving said delayed signal and generating a signal to activate said power return bus.

20 (Original) A multi-frame tape library system as claimed in claim 19, wherein at least one said frame further comprising a total count counter; and wherein said total count counter being incremented by each said pulse on said frame bus until said power return bus is activated.

21 (Original) A multi-frame tape library system as claimed in claim 20, wherein the count in said total count counter represents the total number of said frames connected together.

22 (Previously amended) A modular tape library system comprising:

a plurality of individual library frames connected together in series, each of said plurality of frames comprising a plurality of tapes, a plurality of tape drive mechanisms for reading and writing data to said tapes, one or more controllable robot members to move said tapes to and from said tape drive mechanisms and at least one frame comprising an individual ID counter;

a multi-channel bus for exchanging information and data between said frames indicative of the presence of each said frame;

wherein at least of said frames being adapted to receive a signal indicative of power being supplied to any one of said frames and generate a pulse indicative of its presence and a delayed signal which is forwarded to the next frame in the series, each subsequent frame receiving said delayed signal and generating a further delayed signal and a pulse indicative of their presence; wherein at least one of said frames generating a frame pulse upon generation of that frame's delayed signal, and wherein said individual ID counter being incremented by each said pulse on said frame bus until said frame pulse is detected.

23 (Original) A modular system as claimed in claim 22, wherein the count in said individual ID counter represents the individual ID of the frame with respect to the total number of said frames connected together.

24 (Original) A modular system as claimed in claim 22, wherein said multi-channel bus further comprising a power bus return bus carrying information indicative of the last frame in said series; and wherein one of said frames being defined as said last frame and receiving said delayed signal and generating a signal to activate said power return bus.

25 (Original) A modular system as claimed in claim 24, wherein at least one said frame further comprising a total count counter; and wherein said total count counter being incremented by each said pulse on said frame bus until said power return bus is activated.

26 (Original) A modular system as claimed in claim 25, wherein the count in said total count counter represents the total number of said frames connected together.

27 (Previously amended) A method to automatically detect the individual identification of frames within a modular multi-frame tape library system, said method comprising the steps of:

coupling a plurality of library frames to a multi-channel data bus comprising a frame bus, each of said plurality of frames comprising a plurality of tapes, a plurality of tape drive mechanisms for reading and writing data to said tapes and one or more controllable robot members to move said tapes to and from said tape drive mechanisms;

designating one of said frames as a first frame;

said first frame receiving a signal indicative of power being supplied to any one of said frames and generating a first delayed signal and a pulse indicative of the presence of said first frame;

supplying said pulse indicative of the presence of said first frame to said frame bus;

supplying said delayed signal to a subsequent frame, each said subsequent frame generating a delayed signal and a pulse indicative of the presence of each frame and supplying the pulses to said frame bus;

generating a signal upon generation of said delayed signal; and

incrementing a register by each pulse until said signal is generated.

28 (Original) A method as claimed in claim 27, further comprising the steps of:

coupling said plurality of framed to said multi-channel bus further comprising a power bus return bus;

designating one of said frames as a last frame;

generating a signal to activate said power return bus when said delayed signal reaches said last frame; and

incrementing a register by each said pulse until activation of said power return bus.

29 (Original) A method as claimed in claim 27, wherein the count in said counter represents the individual ID of the frame with respect to the total number of said frames connected together.

30 (Original) A method as claimed in claim 28, wherein the count in said counter represents the total number of said frames connected together.

31 (Previously amended) A multi-frame tape library system, comprising:

a plurality of individual library frames connected in series, each said frame comprising a pulse signal generator, and a delay signal generator, a plurality of tape drive mechanisms for reading and writing data to said tapes, one or more controllable robot members to move said tapes to and from said tape drive mechanisms and at least one said frame also comprising a total count counter and an individual ID counter;

a multi-channel bus coupled to each said frame and comprising a frame bus for carrying information indicative of the presence of each said frame, and a power bus return bus carrying information indicative of the last frame in said series;

wherein one of said frames being defined as a first frame and adapted to receive a signal indicative of power being supplied to any one of said frames and generate a delayed signal, each subsequent frame receiving said delayed signal and generating a further delayed signal and each frame generating a pulse on said frame bus; wherein one of said frames being defined as said last frame and receiving said delayed signal and generating a signal to activate said power return bus; and wherein said total count

counter being incremented by each said pulse on said frame bus until said power return bus is activated; and wherein at least one said frame generating a frame pulse when said delay signal is generated for that frame, said individual ID counter being incremented by each said pulse on said frame bus until said frame pulse is generated.

32 (Original) A multi-frame tape library system as claimed in claim 31, wherein the count in said individual ID counter represents the individual ID of the frame with respect to the total number of said frames connected together.

33 (Original) A multi-frame tape library system as claimed in claim 31, wherein the count in said total count counter represents the total number of said frames connected together.

34 (Previously amended) A method to automatically detect the total count and individual identification of frames within a modular multi-frame tape library system, said method comprising the steps of:

coupling a plurality of library frames to a multi-channel data bus comprising a frame bus and a power bus return bus, each of said plurality of frames comprising a plurality of tapes, a plurality of tape drive mechanisms for reading and writing data to said tapes and one or more controllable robot members to move said tapes to and from said tape drive mechanisms;

designating one of said frames as a first frame;

designating one of said frames as a last frame;

said first frame receiving a signal indicative of power being supplied to any one of said frames and generating a first delayed signal and a pulse indicative of the presence of said first frame;

supplying said pulse to said frame bus;

supplying said delayed signal to a subsequent frame, each said subsequent frame generating a delayed signal and a pulse indicative of the presence of each frame and supplying the pulses to said frame bus;

generating a signal to activate said power return bus when said delayed signal reaches said last frame;

incrementing a first counter by each pulse until said power bus is activated;

generating a frame pulse when said delay signal is generated for that frame;

incrementing a second counter by each said pulse on said frame bus until said frame pulse is generated.

35 (Original) A method as claimed in claim 34, wherein the count in said second counter represents the individual ID of the frame with respect to the total number of said frames connected together.

36 (Original) A method as claimed in claim 34, wherein the count in said first counter represents the total number of said frames connected together.